

CHAPTER 12

MISCELLANEOUS

BMP 12-1	IMPERVIOUS SEALS
BMP 12-2	WATER STORAGE RESERVOIR

BMP 12-1 IMPERVIOUS SEALS

DEFINITION

A method to prevent infiltration of pollutants into surface water or ground water and to seal ponds for water storage.

PURPOSE

To prevent infiltration of pollutants into surface water or ground water by use of impervious seals.

APPLICABILITY

Suitable wherever the potential exists for pollutants to enter ground water basins and for sealing ponds for water storage.

PLANNING CRITERIA

Various methods are available for use in preventing ground water infiltration. The overall practicability of the method should be given careful consideration, along with economic factors, aquifer vulnerability, magnitude of the potential problem, installation requirements, local conditions, acceptability by operators, and future maintenance requirements.

METHODS AND MATERIALS

1. **Clay Seals** - Is a technique to reduce or retard the infiltration of pollutants into ground water. Where good quality clay is available locally, pollutant intrusion into ground water can be reduced by the placement of a compacted zone of clay between the pollutant and the ground water.

Use of clay is dependent on availability and cost of transport to the treatment site. Consideration must be given to equipment available for placement and compaction. The clay sealant must be laid in a uniformly thick layer of sufficient depth to minimize opportunities for leakage of pollutants.

Clay can be placed using various methods. Front end loaders, pull scrapers, belly and end dump trucks, cranes and power shovels could all be used successfully depending on site conditions.

Compaction of clay is also done by several methods. Hand-held "Jitterbug" vibrating compactors are usable for small-scale work. Large roller, vibratory roller and sheepsfoot roller compactors are suited for large areas. Travel of heavy rubber tire equipment over clay surface is often used to compact the clay zone.

Bentonite or montmorillonite is highly suitable due to good sealing characteristics.

2. **Gunite** - Seals the ground surface by pneumatically placed concrete. High application cost allows use only where limited area requires treatment and a strong durable sealer is needed. Use is restricted to sealing small ponds, channels, and tanks. Work should be done by contractors who specialize in gunite application.

A low slump, high strength concrete is used to allow the sealant to be placed pneumatically on irregular, vertical, or overhead surfaces. Acids and other chemicals may attack the surface and cause leaking. Where possible, cements resistant to expected fluid-type should be used.

3. **Asphalt Seals** - Used where lower cost clay is not available and the area to be treated is not large. Most applications require outside services of a contractor specialized in asphalt paving work. Mixing and placement equipment is usually not available to operators. A firm earthen base is needed to allow placement of asphalt since heavy rolling compactors are utilized to lay the sealant. Asphalt is a good choice as a sealant except where fuels, acetates, alcohols, and other similar type materials exist in substantial amounts. Only cold mix type asphalts are considered satisfactory as a sealant. High-cost precludes hot mix asphalt from consideration unless the site is very small and a mixing plant is close by.
4. **Plastic Sheet Seals** - Are useful as a sealant where resistance is needed from attack by most chemicals and acids. High temperature may result in breakdown of sealant. Manufacturing representatives should be sought for advice on specific applications.

Limited areas, such as small collection reservoirs, are ideally suited for plastic sheet seals. High initial cost may prevent this practice from being used. The surface area where applied must be carefully prepared with sand or soft dirt to prevent cuts from sharp rocks or other rough material. Polyethylene sheeting is the most commonly used plastic. The material is sometimes installed as a solid sheet or in overlapping strips. Heavier strips can be fused by welding in place.

MAINTENANCE

Frequent inspections are recommended with repairs or modifications made when necessary. A comprehensive maintenance program is necessary to ensure integrity of the seal.

EFFECTIVENESS

Effectiveness will be based on proper selection, design, installation and regular maintenance.

BMP 12-2 WATER STORAGE RESERVOIR

DEFINITION

A water storage reservoir made by constructing a dam or an embankment.

PURPOSE

Storage reservoirs are constructed to conserve water by holding it in storage for later beneficial use. Uses include irrigation, domestic water, mining, industrial applications, recreation, wildlife, flood control and streamflow regulation.

APPLICABILITY

Applies to sites that meet the following criteria:

1. There is a need for stored water for beneficial use.
2. Water for storage is available from surface runoff, streamflow or pumped ground water.
3. Topographic, geologic and soil conditions for construction of a dam or earthen embankment and storage reservoir.

PLANNING CRITERIA

Water storage reservoirs must be fully investigated, designed and installed under supervision of qualified professional engineers. Plans, designs and installation must meet the requirements of all applicable state statutes and regulations including water rights.

MAINTENANCE

A comprehensive maintenance program should be developed for the water storage reservoir. Regular inspections of the dam or earthen embankment and other facilities are necessary. Any deficiencies must be immediately corrected.

EFFECTIVENESS

Storage provides water for use during low flow periods and aids in flood control, regulating stream flow and sediment reduction.